

REMARKS

Claims 1, 3, 5-15 are pending in the present application. Claim 2 has been cancelled. Claims 6-13 are withdrawn from consideration. Claims 1, 14 and 15 have been amended. No new matter has been added by way of these amendments.

Claim 1 has instantly been amended as follows:

With respect to the silica-containing laminated structure, the limitation “minimum reflectance of from 0.1 to 0.45 %” has been introduced. Support for this amendment is found in the Examples of the present application. Specifically, as can be seen from Tables 1 to 4 on pages 108-111 of the specification of the present application, the minimum reflectance values 0.1 % and 0.45 % are, respectively, the lowest and highest values in the Examples of the present application.

With respect to the porous silica layer, the limitation “pencil hardness of H or higher as measured in accordance with JIS K5400 under a load of 1 kg, using a testing pencil as defined in JIS S6006” has been added. Support for this amendment is found in the Examples of the present application. Specifically, as can be seen from the above-mentioned Tables 1 to 4 of the present specification, the pencil hardness evaluations on the porous silica layers formed in the Examples of the present application are “H” or higher.

With respect to the moniliform silica strings, the limitation of claim 2 (average length of from 30 to 200 nm) has been introduced. Claim 2 has been cancelled accordingly.

With respect to the primary silica particles constituting the moniliform silica strings, the limitation “average particle diameter of from 12 to 25 nm” has been introduced. The value “12” is the lowest value in the Examples of the present application, whereas the value “25” is described at page 35, line 7 of the specification of the present application.

Claims 14 and 15 have been amended in a manner similar to claim 1.

Thus, no new matter has been introduced by the instant amendments.

Rejection Under 35 USC § 102(b)/ 103(a)

Claims 1-3, 5, 14 and 15 stand rejected under 35 USC § 102(b) and 103(a). Applicants respectfully traverse.

Legal Standard for Determining Anticipation

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “When a claim covers several structures or compositions, either generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art.” *Brown v. 3M*, 265 F.3d 1349, 1351, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001) “The identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Legal Standard for Determining Prima Facie Obviousness

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

“There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.” *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper.). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

“In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification.” *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. “The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.” *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to

the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The Supreme Court of the United States has recently held that the teaching, suggestion, motivation test is a valid test for obviousness, but one which cannot be too rigidly applied. See *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007).

The Supreme Court in *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007) reaffirmed the Graham factors in the determination of obviousness under 35 U.S.C. § 103(a). The four factual inquiries under Graham are:

- (a) determining the scope and contents of the prior art;
- (b) ascertaining the differences between the prior art and the claims in issue;
- (c) resolving the level of ordinary skill in the pertinent art; and
- (d) evaluating evidence of secondary consideration.

Graham v. John Deere, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

The Court in *KSR Int'l Co. v. Teleflex, Inc.*, *supra.*, did not totally reject the use of "teaching, suggestion, or motivation" as a factor in the obviousness analysis. Rather, the Court recognized that a showing of "teaching, suggestion, or motivation" to combine the prior art to meet the claimed subject matter could provide a helpful insight in determining whether the claimed subject matter is obvious under 35 U.S.C. § 103(a).

Even so, the Court in *KSR Int'l Co. v. Teleflex, Inc.*, *ibid.*, rejected a rigid application of the "teaching, suggestion, or motivation" (TSM) test, which required a showing of some teaching, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the prior art elements in the manner claimed in the application or patent before holding the claimed subject matter to be obvious.

Discussion of Cited Prior Art

Specifically, in response to the Applicants' previous arguments, the Examiner has taken the position that the Applicants' arguments are not supported by evidence. Applicants submit herewith a **Declaration Filed Under 37 C.F.R. § 1.132 by Mr. Masayuki Nakatani (hereinafter "Nakatani Declaration")**, in support of the patentability of the presently claimed invention.

Moreover, claim 1 of the present application has been amended to recite that the laminate structure of the present invention (comprising a transparent resin substrate and, laminated thereon, at least one porous silica layer) exhibits excellent optical characteristics (i.e., the reflective index of the porous silica layer is 1.22 or more and less than 1.30; and the minimum reflectance of the laminated structure is 0.1 to 0.45 %),

the porous silica layer has an excellent strength (i.e., the pencil hardness of H or higher), such excellent optical characteristics and excellent strength are simultaneously achieved due to the specific pore structure of the porous silica layer wherein the porous silica layer has a large amount of large pores such that formula (1) recited in claim 1 of the present application is satisfied, and

such specific pore structure is formed by the use of coating composition produced by mixing a dispersion of moniliform silica strings having a specific dimension (wherein primary silica particles having an average particles diameter of 12 to 25 nm are linked together to form moniliform silica strings having an average length of 30 to 200 nm) with a hydrolysable silane.

As already discussed in the Applicants' previous response, and as also apparent from amended claim 1 explained above, the silica-containing laminated structure of the present invention is excellent in respect of both optical characteristics and strength, which could not be simultaneously improved by the conventional techniques. Such excellent characteristics are achieved due to the use of a coating composition produced by mixing a dispersion of moniliform silica strings, having a specific dimension, with a hydrolysable silane, which coating composition contributes to the formation of the above-mentioned specific pore structure of the

porous silica layer. This is quite unexpected because, as taught at col. 5, lines 28-36 of Lange, it has conventionally been believed that the “particle agglomeration prior to preparation of the coating composition” should be prevented.

In this connection, it should especially be noted that, in all of the Examples of Lange, the reflectance is much larger than the upper limit (0.45 %) of the minimum reflectance recited in instantly amended claim 1 of the present application. More specific explanations are made below.

Lange attempts to improve the light transmission of a coated article having a porous silica coating (col. 2, lines 53-64 of Lange). In the Examples of Lange, both transmission and reflectance are measured in Example 1 (col. 6, lines 46-58), and only transmission is measured in the rest of the Examples (Table 2 at cols. 7 and 8).

As pointed out by the Examiner, the refractive index of a porous coating is mentioned in Lange, but is mentioned only in connection with a theoretical relationship between the refractive index and the porosity. Lange does not demonstrate providing a porous silica coating having a refractive index while maintaining the strength of the porous silica coating at a practically acceptable level.

In order to evaluate the reflectance and the actual refractive index in Lange, the reflectance values and the refractive indices in the Examples of Lange are calculated from the transmission values shown in the Examples of Lange. *See* the Nakatani Declaration. (In this connection, as mentioned above, Lange attempts to improve the light transmission of a coated article having a porous silica coating and, hence, it is reasonable to consider that the improvements in the reflectivity values and the refractive indices in the Examples of Lange are at the highest levels as far as the technique of Lange is put into practice.) The methods and results are described in **Exhibit 1** of the accompanying Nakatani Declaration.

From the results of Exhibit 1 of the accompanying Nakatani Declaration, it can be fairly concluded that:

the reflectance of the coated article of Lange is 1.0 % at the lowest (measured at a wavelength of 600 nm with respect to one surface of the sample), which is still higher than the reflectance (0.1 to 0.45 %) recited in claim 1 of the present application,

the calculated refractive index (with respect to one surface of the sample) is 1.382 at the lowest, which is still higher than the refractive index (1.22 to 1.30) recited in claim 1 of the present application,

with respect to the relationship between the porosity of the porous silica coating and the refractive index (RI), which is represented by the formula shown at col. 4, line 45 of Lange, such a relationship is nothing more than a generally theory, and does not mean that Lange can provide a silica coating having an “index of refraction of from about 1.15 to 1.40, preferably 1.20 to 1.30” without sacrificing the strength of the silica coating,

the only optical characteristic that is actually measured in Lange is the transmittance from which the above-mentioned reflectance and refractive index are determined, and

it is apparent that the optical characteristics (the refractive index and the minimum reflectance) as recited in claim 1 of the present application cannot be achieved by Lange while maintaining the strength of the porous silica coating at a practically acceptable level (i.e., a pencil hardness of H or higher as measured in accordance with JIS K5400 under a load of 1 kg, using a testing pencil as defined in JIS S6006).

Further, in order to confirm the results of Exhibit 1, the experiments were conducted to evaluate the reflectance of the “coated articles” produced in the Examples of Lange, and the refractivity and strength of the silica coatings of the coated articles. The methods and results are described in **Exhibit 2** of the accompanying Nakatani Declaration.

From the results of Exhibit 2, it can be fairly concluded that:

the reflectance of the coated article produced in accordance of Lange (at all wavelengths those used in the present application for the measurement of minimum reflectance) is much higher than the range (0.1 to 0.45 %) recited in claim 1 of the present application,

the refractive index of the silica coating formed in accordance with Lange is 1.364 at the lowest, which is still higher than the range (1.22 or more and less than 1.30) recited in claim 1 of the present application,

the silica coating formed in accordance with Lange has a pencil hardness lower than "H",

the above-mentioned poor optical characteristics and poor strength in Lange (as compared to the present invention) are attributable to the difference in structure of the silica coatings, and

it has been confirmed that, by the technique of Lange, it is impossible to obtain the silica-containing laminated structure of the present invention which is advantageous in that the porous silica layer has not only low refractivity but also high strength, and, thus, the results of Exhibit 1 have been confirmed.

From the above, it is apparent that Lange does not teach or suggest the essential features of the present invention and the surprising and superior effects achieved thereby. Evidence of unobvious or unexpected advantageous properties, such as superiority in a property the claimed compound shares with the prior art, can rebut *prima facie* obviousness. "Evidence that a compound is unexpectedly superior in one of a spectrum of common properties . . . can be enough to rebut a *prima facie* case of obviousness." *In re Chupp*, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987). Applicants have sufficiently demonstrated in the Nakatani Declaration, including Exhibits 1 and 2, the superior and unexpected advantages of the present invention. Therefore, the present invention is neither anticipated by nor rendered obvious by Lange.

In view of the foregoing, Applicants believe the pending application is in condition for allowance. A Notice of Allowance is earnestly solicited.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Monique T. Cole, Reg. No. 60,154 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

Dated: February 27, 2008

Respectfully submitted,

By 

John W. Bailey

Registration No.: 32,881

BIRCH, STEWART, KOLASCH & BIRCH, LLP

8110 Gatehouse Road

Suite 100 East

P.O. Box 747

Falls Church, Virginia 22040-0747

(703) 205-8000

Attorney for Applicant

**Attachments: Executed Declaration by Masayuki Nakatani
Exhibits 1 and 2**